

Using the Geographic Update Partnership Software (GUPS) for Census Bureau Geographic Partnership Programs

Big Sky GeoCom 2018

Helena, MT

April 17, 2018

Agenda

- Background on Census Geography and the Census Bureau's Geographic Programs
- How the Census Bureau Stores and Maintains Geographic Data
- How to Use GUPS for the Census Bureau's Geographic Programs

Census Bureau Geographic Areas

Legal Versus Statistical Boundaries

Legal

- **States (and equivalents)** (57)
- **Counties** (3,000)
- **County subdivisions**
(Minor Civil Divisions) (31,000)
- **Places** (Incorporated) (19,000)
- **Tribal areas** (Reservations and trust land) (400)

Administrative

- **Election areas** (186,000)
- **School districts** (13,000)

Statistical

- **Regions** (5)
- **Divisions** (10)
- **County subdivisions**
(Census county divisions) (5,000)
- **Places** (Census designated) (10,000)
- **Tribal areas** (Statistical areas) (280)
- **Census tracts** (74,000)
- **Block groups** (220,000)
- **Tabulation blocks** (11 million)
- **Metropolitan/Micropolitan areas** (1,000)
- **Urban areas** (3,000)
- **ZCTAs** (33,000)

Administrative Geography

Administrative measures create administrative boundaries, specify their governmental or administrative functions, and contain provisions for establishing and changing their names and boundaries

Redistricting Data

- Congressional Districts
- State Legislative Districts (Lower Chamber)
- State Legislative Districts (Upper Chamber)
- Voting Districts

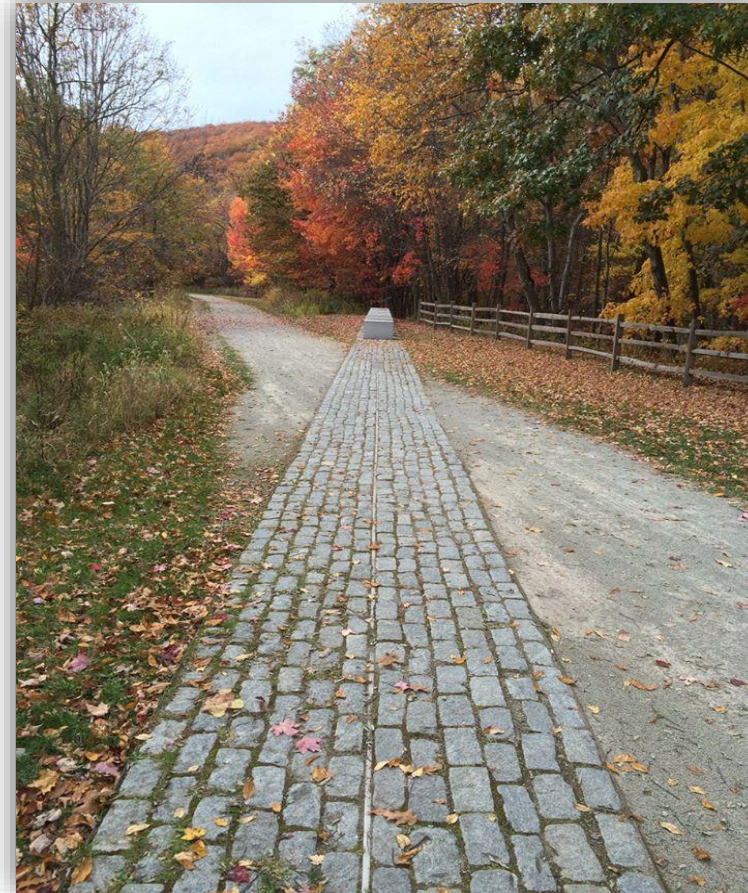
School Districts

- Elementary
- Secondary
- Unified

Legal Geography

Legal entities originate from legal actions, treaties, statutes, ordinances, resolutions, court decisions, etc

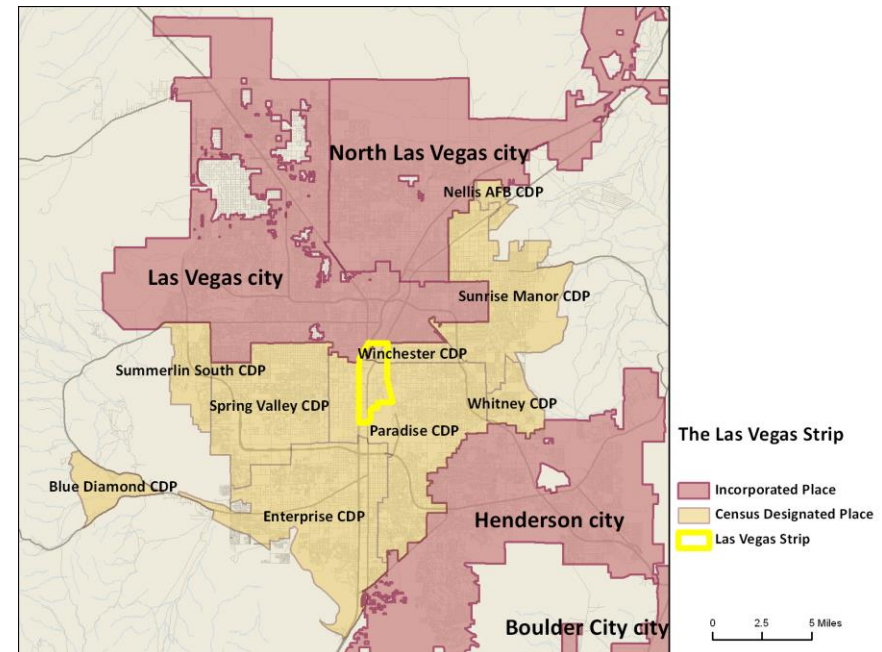
- State and Equivalent
- County and Equivalent
- Consolidated City
- Incorporated Places
- Minor Civil Divisions (County Sub)
 - Townships
- Alaska Native Regional Corporation
- American Indian/Alaska Native
 - Off Reservation Trust Lands
 - Native Hawaiian Area
 - American Indian Tribal Subdivision
- Puerto Rico
 - Subbarrio
 - Subminor Civil Division



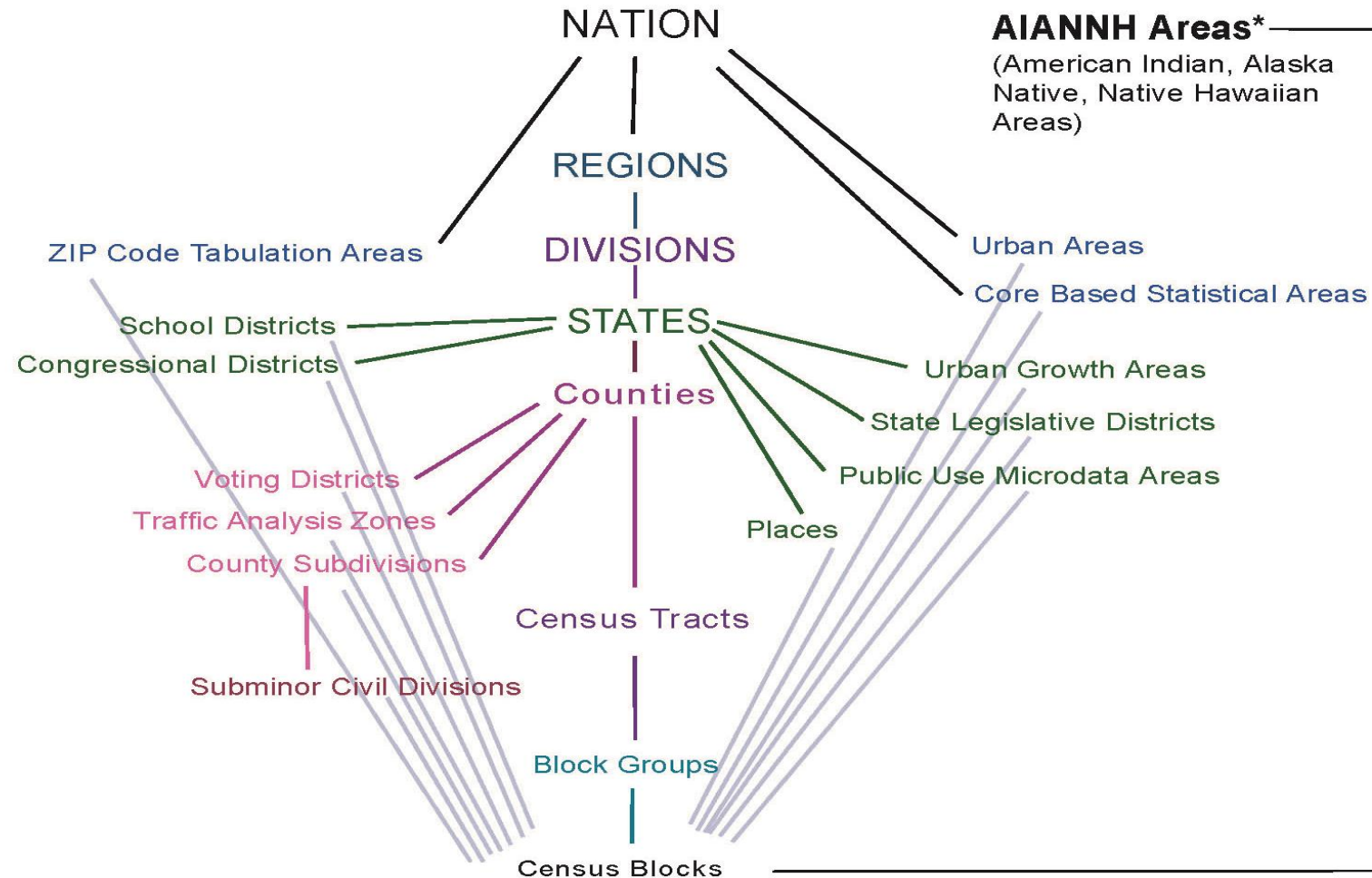
Statistical Geography

Statistical geography involves geographic areas defined solely for data collection, tabulation, and analysis

- Tabulation Block
- **Census Designated Place**
- Census Tract
- Block Group
- Alaska Native Village Statistical Areas (ANVSAs)
- Oklahoma Tribal Statistical Areas
- Tribal Census Tract
- Tribal Census Block Group



Hierarchy of Census Geographic Entities



Addresses and Streets

- In addition to collecting accurate boundaries for administrative, legal, and statistical geographies, the Census Bureau also maintains:
 - A national address list of every housing unit in the U.S.
 - A national street map
- This information will be used with boundary data to conduct the 2020 Census, tabulate the results, and create data products

Geographic Partnership Programs

Partnership Opportunities

- Redistricting Data Program (RDP)
 - Voting Districts and Block Boundary Suggestions
- Boundary and Annexation Survey (BAS)
 - All Legal Geography
- Participant Statistical Areas Program (PSAP)
 - Previously listed statistical geography except blocks, regions, divisions, metro/micro, urban areas, ZCTAs
- Local Update of Census Addresses (LUCA)
- School District Review Program (SDRP)
- Address and Road Data Collection (does not use GUPS except through other programs)

Geographic Partnership Programs

Redistricting Data Program – Phase 1 – The Block Boundary Suggestion Project

Schedule

Activity	Date
Initial Delineation	December 2015 – May 2016
Verification	December 2016 – May 2017

Activities

States can influence the 2020 tabulation blocks

- Must Hold/ Do Not Hold
- Missing Features
- Misaligned Features

Update Area Landmark (state parks, prisons, etc.) boundaries

Suggest updates to legal boundaries

Geographic Partnership Programs

Redistricting Data Program – Phase 2 – The Voting District Project

Schedule

Activity	Date
Initial Delineation	December 2017 – May 2018
Verification	December 2018 – May 2019

Activities

States provide their Election Districts/Precincts/Wards

States can influence the 2020 tabulation blocks

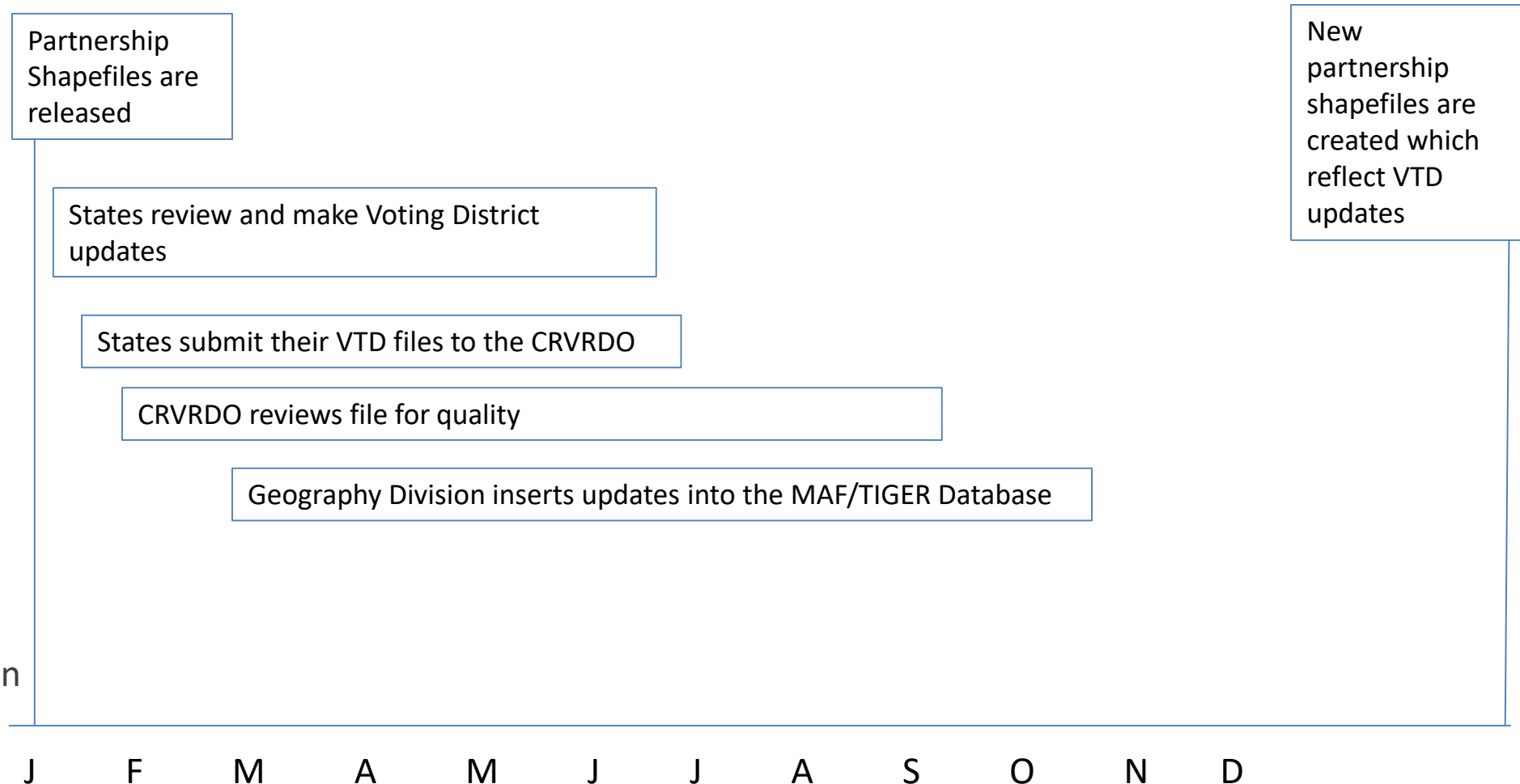
- Missing Features
- Misaligned Features

Update Area Landmark (state parks, prisons, etc.) boundaries

Suggest updates to legal boundaries

Geographic Partnership Programs

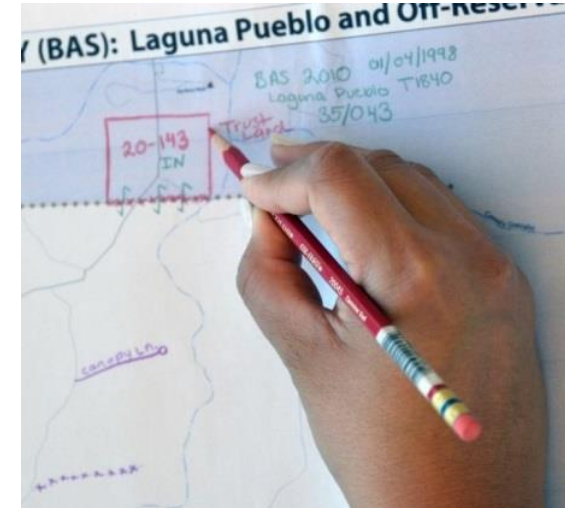
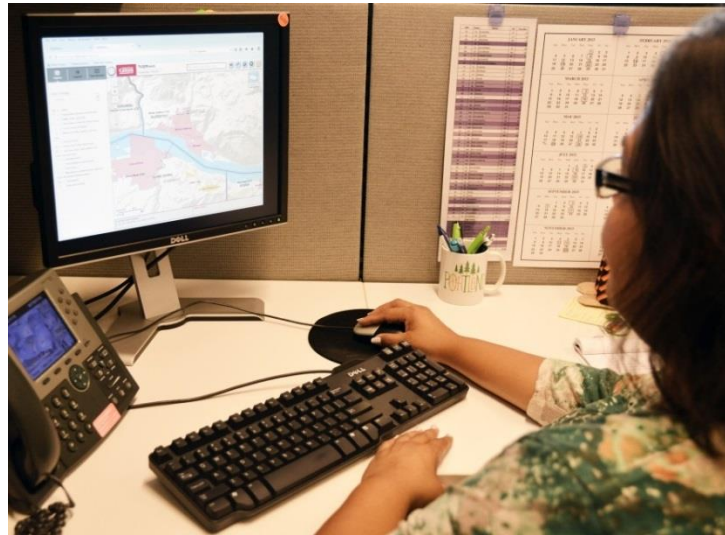
Redistricting Data Program – Phase 2 – The Voting District Project



Geographic Partnership Programs

Boundary and Annexation Survey

- Annual, voluntary survey to collect legal status and boundary information for local governments
- Review the legal boundaries the Census Bureau has on file



- Boundaries must be legally in effect on or before January 1st of each year
- Make corrections and updates to their boundaries
- Boundary updates submitted by deadline are reflected in the American Community Survey and Population Estimates

Geographic Partnership Programs

Boundary and Annexation Survey Schedule

Activity	Date(s)
Annual Response information emailed	December 2017/January 2018
Annexations must be effective by this date in order to be processed	January 1, 2018
Deadline for BAS submission to be included in Population Estimates Program and the American Community Survey	March 1, 2018
State Data Center non-response follow up	March/April 2018
Deadline for BAS submission to be reflected in 2017 BAS Materials	May 31, 2018

Geographic Partnership Programs

Participant Statistical Areas Program (PSAP)

- Update and create the boundaries for Census geographies such as
 - Census Designated Places (CDPs)
 - Census Tracts
 - Block Groups
 - Other Tribal Statistical Areas
- Encourage state as well as Regional Commissions and Councils to participate in the data review and update for non-tribal areas
- Encourage federal and state recognized tribal officials to participate in data review and update for tribal areas
- These areas are a critical part of our geographic hierarchy for data dissemination for small geographies

Geographic Partnership Programs

2020 Local Update of Census Addresses (LUCA)

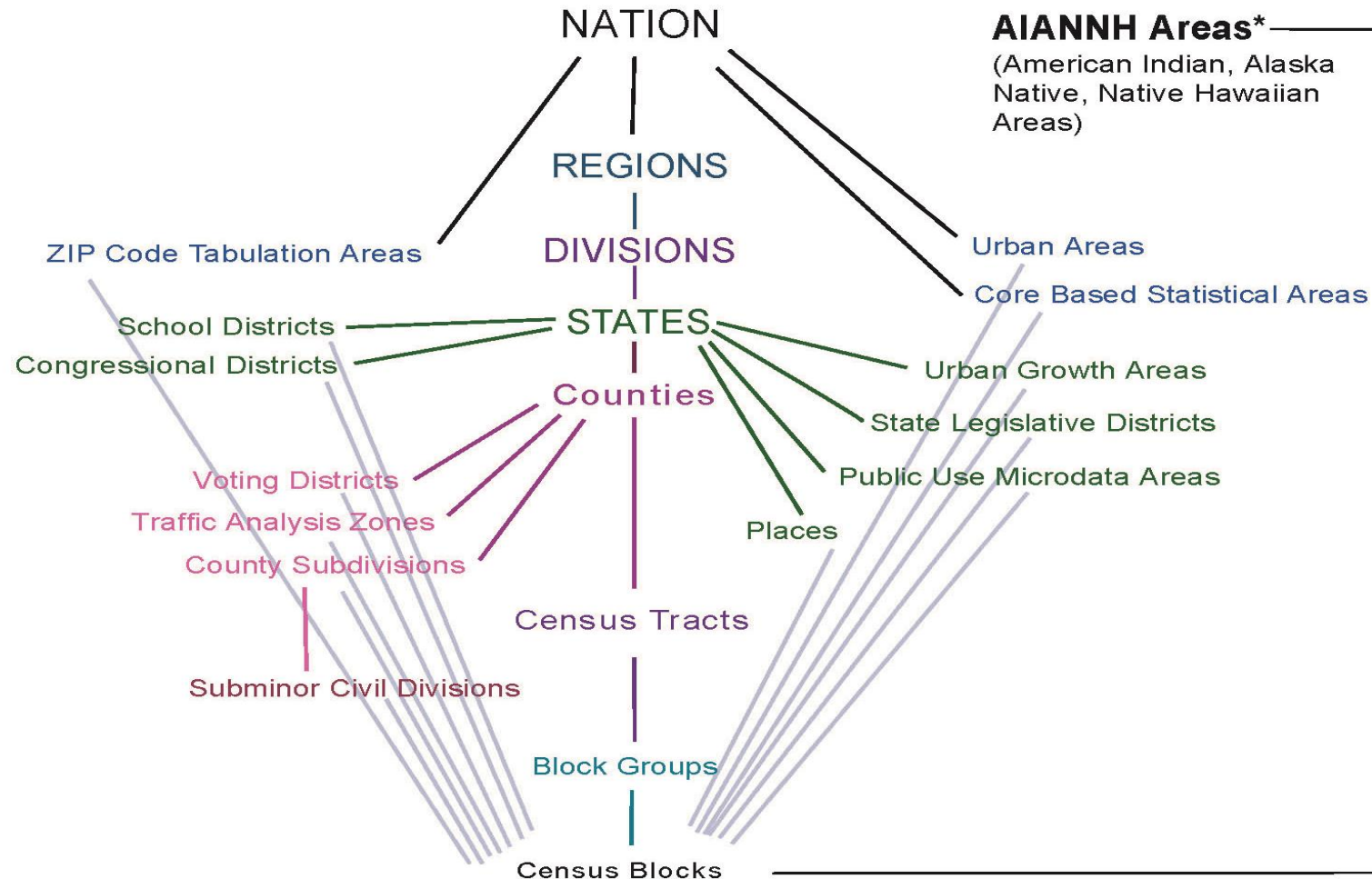
- Provides an opportunity for designated representatives within tribal, state and local governments to review the Census Bureau's address list before the 2020 Census
- Ensure the accuracy and location of addresses are correct prior to the Census

Geographic Partnership Programs

2020 Local Update of Census Addresses (LUCA)

Activity	Date(s)
Mail Advanced Notice Package	January 2017
Mail Invitation Package	July 2017
Mail Review Materials	February 2018
Deliver Feedback Materials	August 2019
Process Appeals	October 2019
Closeout LUCA Program (complete survey and assessment)	September 2021

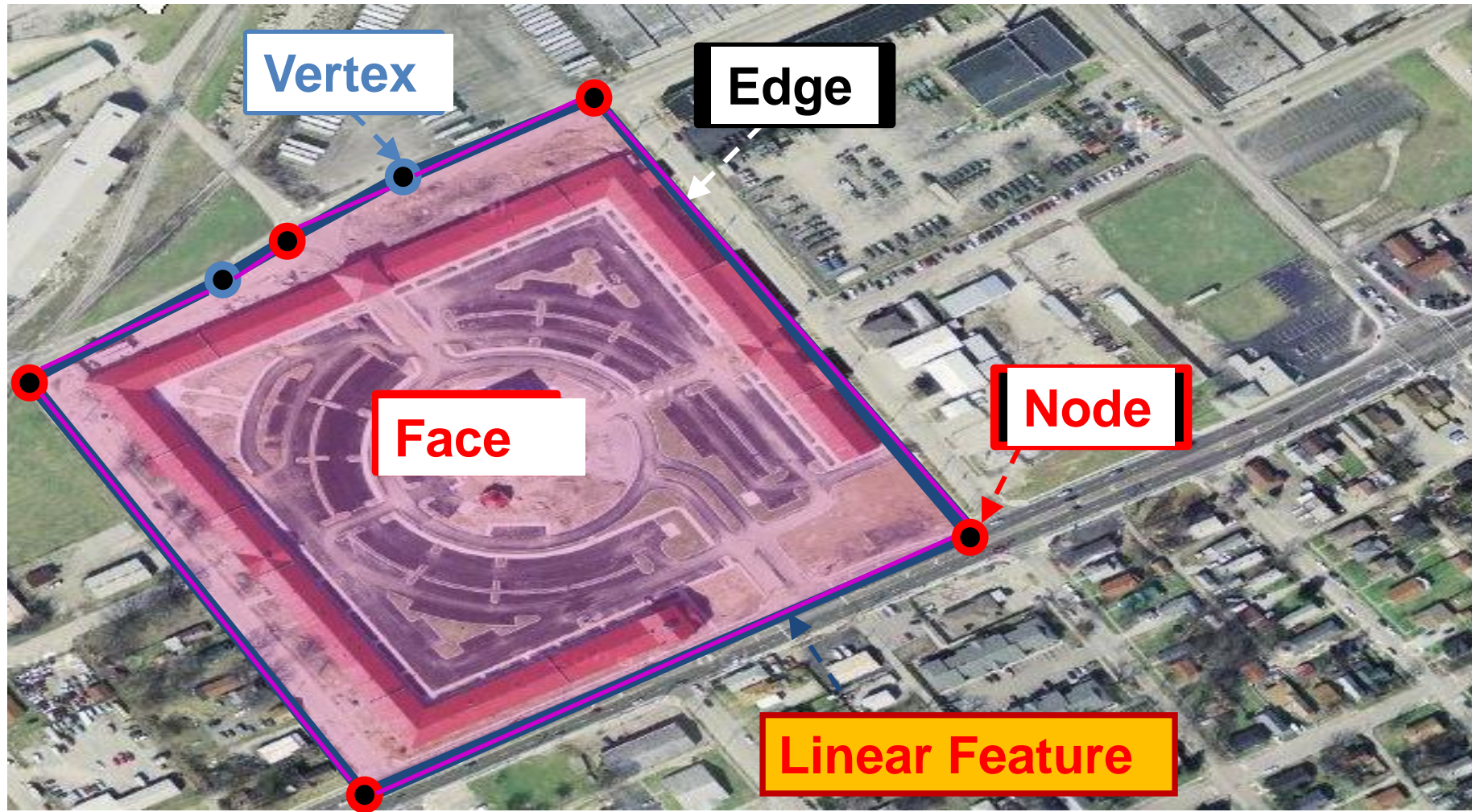
How the Census Bureau Stores Geographic Data



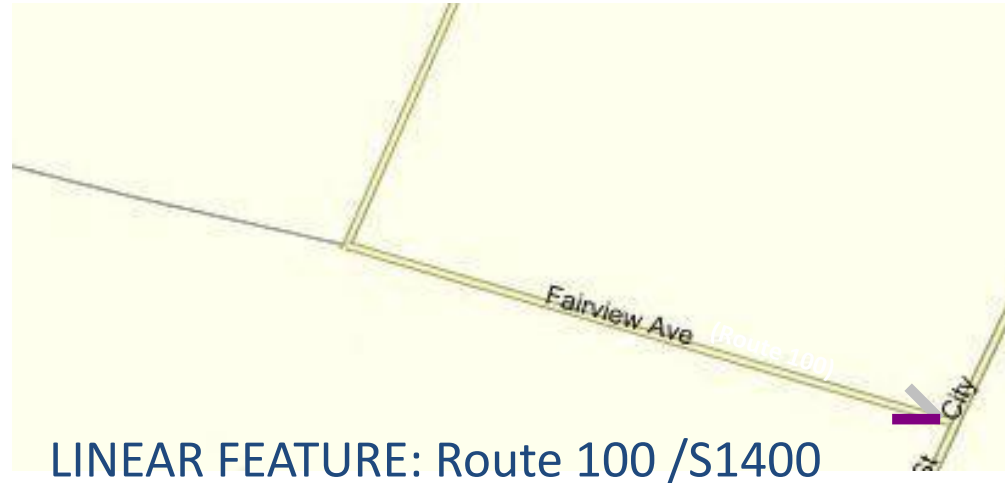
Master Address File/Topologically Integrated Geographic Encoding & Referencing System MAF/TIGER

- Seamless Nationwide Oracle Database
- Includes spatial and address data
- Maximizes storage by having higher features based on primitive features (nodes, edges and faces)
- Primitive features are building blocks: used to define features and hierarchical features
- Partitioned by County
- Well over 50 terabytes
- Contains: 160 million map spots
70 million edges
220 million faces

MAF/TIGER Terminology



MAF/TIGER Structure – Edges/Linear



LINEAR FEATURE: Route 100 /S1400



LINEAR FEATURE: Fairview Ave /S1400

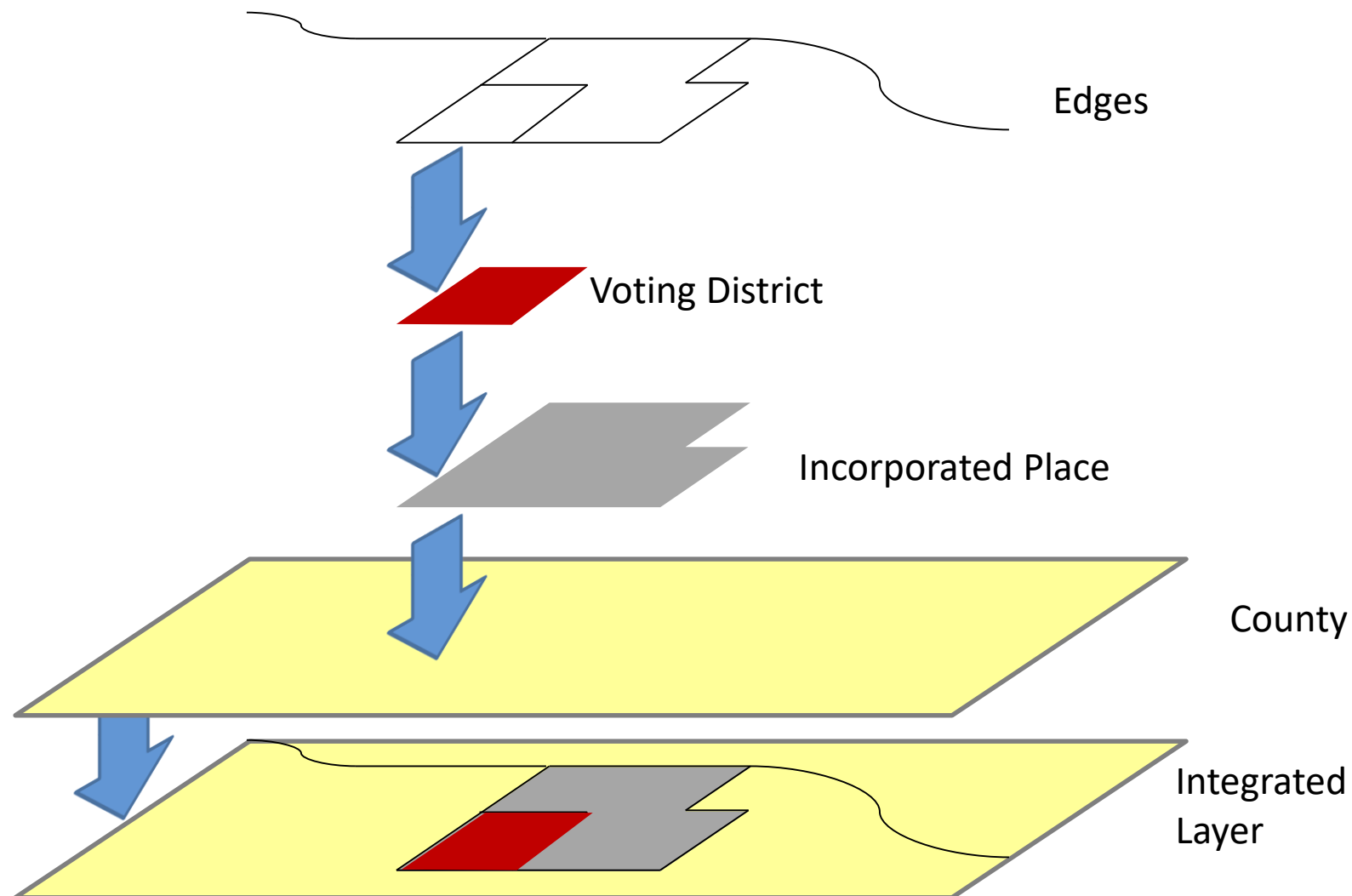


Boundary Fairview Township/ Lee Township

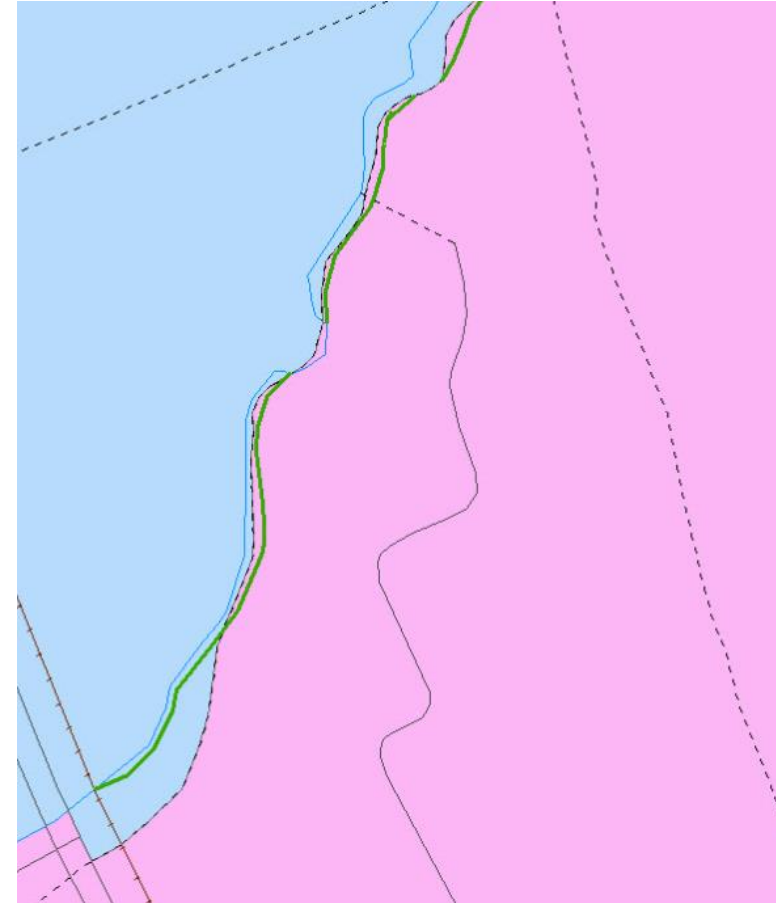
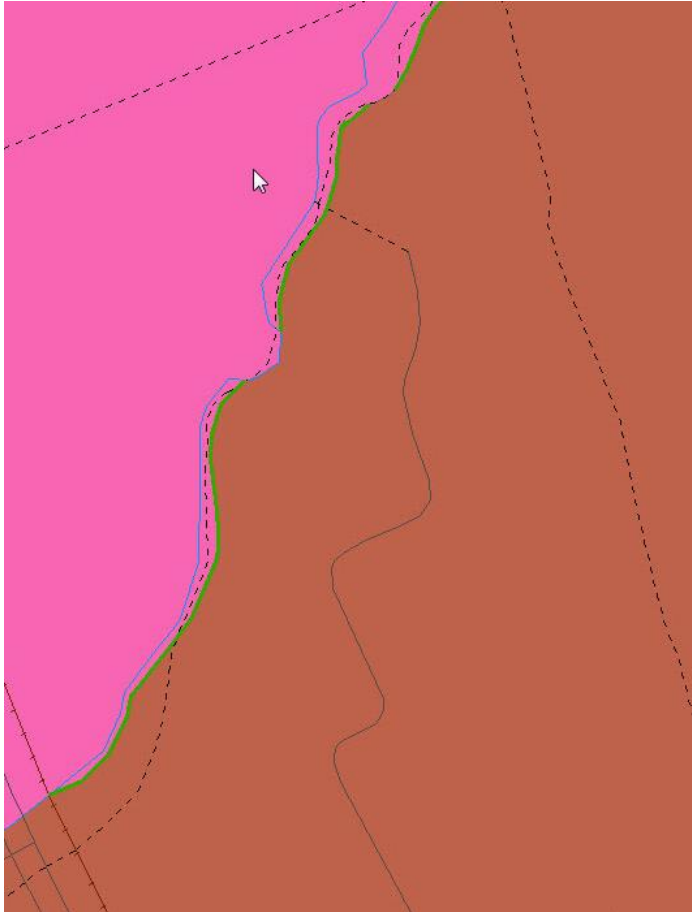
Edge



MAF/TIGER Topology



How Topology Makes Cleaner Nesting Geography



How Topology Makes Cleaner Nesting Geography



How Topology Makes Cleaner Nesting Geography



Participating in Geographic Partnership Video

Using GUPS for Census Geographic Partnership Programs

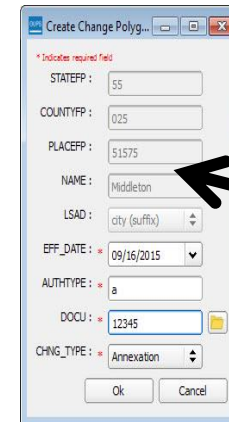
Geographic Update Partnership Software (GUPS)

- Based on Q-GIS open source software
- Used for all U.S. Census geographic exchange partnership programs
- Customized tools for streamlining program specific actions
- Web download of source data directly into the system
- Export into U.S. Census required formats for easy transfer and processing

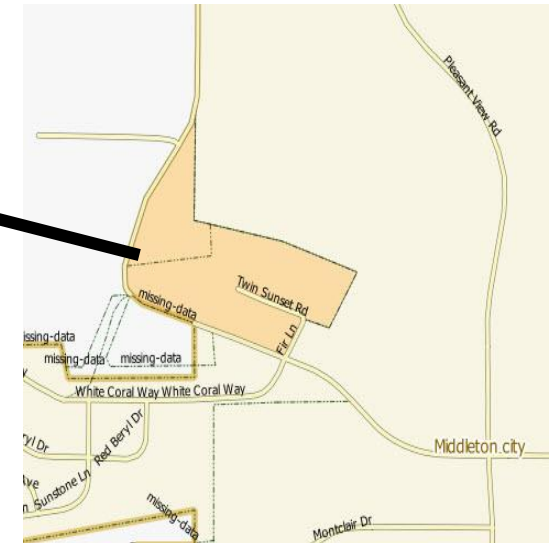
Using GUPS for Census Geographic Partnership Programs

Geographic Update Partnership Software (GUPS)

- Provides a common geographic update tool that will allow over 40,000 tribal, state, and local governments to submit digital updates for geographic programs such as BAS
- Makes geographic program participation more convenient for participants by offering the ability to view and update Census Bureau geospatial and tabular data
- Partners from tribal, state, and local partners contribute to the improvement of the Census Bureau's MAF/TIGER geospatial database by creating transaction-based geographic updates for boundaries, addresses, streets and other geographies

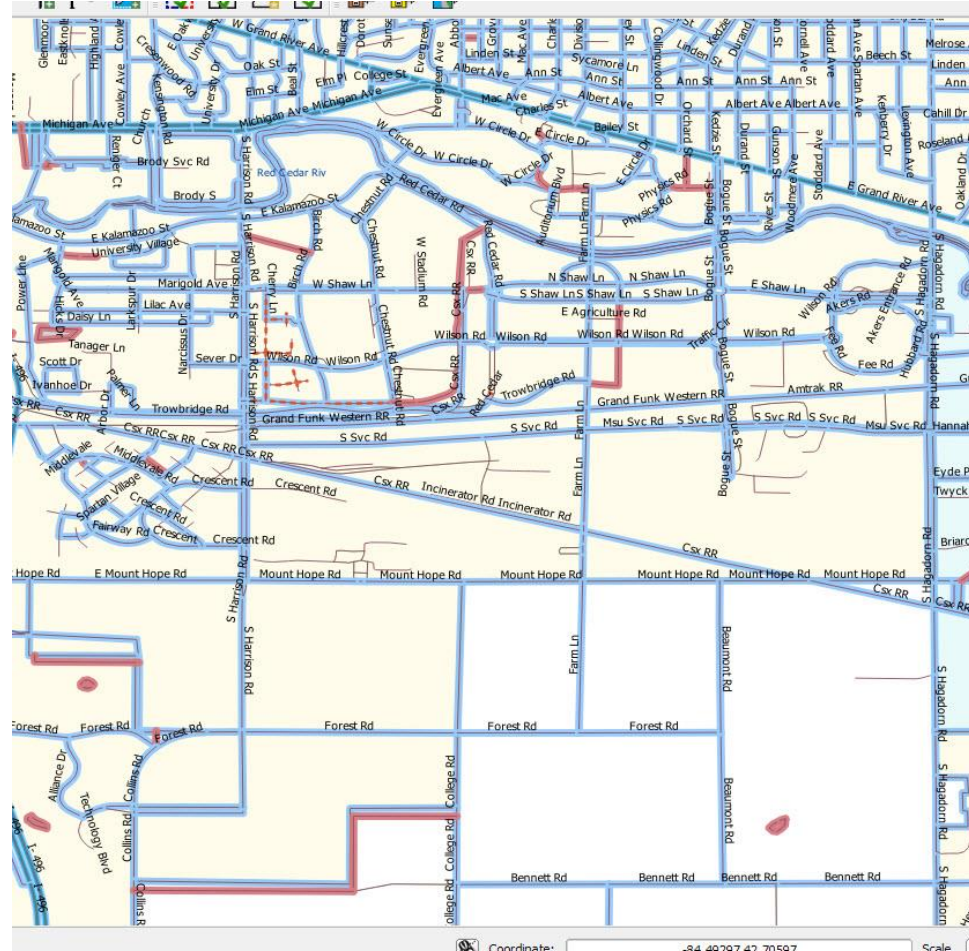


A screenshot of the 'Create Change Poly...' form in the GUPS software. The form contains several input fields with the following values: STATEFP: 55, COUNTYFP: 025, PLACEFP: 51575, NAME: Middleton, LSAD: city (suffix), EFF_DATE: 09/16/2015, AUTHTYPE: a, DOCU: 12345, and CHNG_TYPE: Annexation. There are 'Ok' and 'Cancel' buttons at the bottom. A red asterisk indicates required fields. A black arrow points from the 'NAME' field to the map on the right.



Some Features of GUPS

- Custom Symbolization Based on the Program Initiated in the Tool



For More Information on Census Geographic Programs and GUPS

www.census.gov/geography

- Click on Reference for information on geographic entities
- Click on Partnerships for information on partnership programs and GUPS

www.census.gov/rdo

For information on the Redistricting Data Program and Voting Districts

The screenshot shows the 'United States Census Bureau' website. The top navigation bar includes links for 'TOPICS', 'GEOGRAPHY', 'LIBRARY', 'DATA', 'SURVEYS/PROGRAMS', 'NEWSROOM', and 'ABOUT US'. The 'GEOGRAPHY' section is active, showing a sidebar with links like 'About this Section', 'Education', 'GSS Initiative', 'Interactive Maps', 'Maps & Data', 'Metropolitan and Micropolitan', 'Partnerships', 'Reference', and 'Research'. The main content area features a map of California and a 'Latest' section with buttons for 'Maps & Data', 'Reference', 'Partnerships', and 'GSS Initiative'. The 'Reference' and 'Partnerships' buttons are circled in red. Below these buttons are three featured sections: 'TIGER Products' (Spatial extracts for use in GIS software), 'TIGERweb' (A web-based application for viewing geographic data), and 'Reference Maps' (Reference maps showing boundaries and names of geographic areas). A 'View All Maps & Data' link is at the bottom of the featured sections. In the bottom right corner, there is a 'Is this page helpful?' survey with 'Yes' and 'No' options.